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ABSTRACT

This digest looks at school district size and its possible relationship to school performance, defined here as aggregate achievement of a school's students on state-mandated tests. An overview of size issues briefly discusses class size, school size, district size, and organizational "scaling" or coordination of various levels of size. Historical changes in school district size for 1937-97 are examined, followed by current variation in district size by rural/urban and nonmetropolitan/metropolitan locale categories. The predominance of smaller school districts in all locale categories and the concentration of larger districts in certain states are pointed out. Research in California, West Virginia, Georgia, Montana, Ohio, and Texas is reviewed indicating that the negative influence of socioeconomic status on academic performance is reduced in smaller schools and school districts, often dramatically. In impoverished communities, small schools in small districts boosted school performance. In addition, smaller districts and smaller schools demonstrated greater achievement equity. Implications for district consolidation decisions, research needs, and policy analysis needs are discussed. (Contains 49 notes.) (SV)

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Rural Education Issue Digest

School District Size and School Performance

by Craig B. Howley

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Rural Education
Issue Digest

School District Size and School Performance

by Craig B. Howley

School district size has long been considered from an administrative perspective as a question of how best to organize the enterprise of schooling.[1] School districts, after all, exercise a continuing high-profile role as fiscal and organizational entities in American schooling. More critically, however, district size has recently been shown to influence school performance.

This digest looks at district size and its possible relationship to school performance, interpreted here as aggregate school performance on state-mandated tests. The examination begins with an overview of related size issues and then reports the distribution of district size in the United States. The discussion gives particular attention to the variability of district size among rural and nonmetropolitan small-town districts and to connections between district size and variability in school performance (the aggregate achievement of students in a school). The digest concludes with implications for research and practice.

Size Issues and Organizational Scaling

District size is part of a continuum of size issues ranging from classroom size (student-teacher ratio) to school size (best perceived as students per grade) to district size (total district enrollment). Very little research has addressed the ways in which these different levels of size interact with one another; however, among other considerations, this digest summarizes the findings from a recently published study that does connect school and district size.[2]

Class size. Substantial literature addresses the issue of *class size*.[3] In general, smaller classes have been shown to improve student achievement in the early grades of school. Reductions in student-teacher ratios, however, need to be substantial (classrooms of 12 to 15 students) to register the gains reported by the most credible studies in the literature.[4] Nonetheless, many state education agencies (SEAs) have placed upper limits on classroom size, especially at the elementary level.

School size. Substantial literature on *school size* also has emerged within the past two decades. Very recently, highly respected authorities have strongly implied that high schools ought never to enroll more than 600 to 1,000 students.[5] Overall, at the present moment, wide consensus indicates that many Americans think schools are too large, especially high schools in urban areas.

District size. *District size* has not received similar scrutiny, despite findings that parallel those for school size and student achievement.[6] Indeed, most research about district size considers economic and staffing issues (e.g., teacher supply and demand, superintendent turnover, decision making and governance, and fiscal efficiency).

On one hand, the oversight is *not* puzzling.[7] Districts *organize* schooling: they are the local education agencies (LEAs). They hire and fire teachers and principals, build and maintain schools, determine local policies, interpret state and federal policies at the local level, and, in some states, also levy taxes. The authority of LEAs, in fact, is sufficiently strong that, in state after state, coalitions of rural districts have sued SEAs in the hope of improving their funding. More often than not, the courts have ordered changes in state-level finance schemes.

On the other hand, the oversight *is* puzzling. If district size is organizationally important, it would seem necessarily to have *some* relationship to the core issues in schooling: student achievement, school improvement, and the influence of community circumstances.[8] It would be strange indeed if substantial organizational differences (such as district size) were not related, directly or indirectly, to these core issues.

Organizational scaling. Not only might these different sorts of sizes—these differing levels of size—influence school and student performance, but it might well be that academic performance is thoroughly structured by the overall "scaling" of a system. In particular, scaling on these terms would represent the extent to which an education system is *scaled* to develop engagement and familiarity, or, less fortunately, how it is scaled to develop detachment and distance. The coordination of the various levels of size, then, might be understood to constitute the scaling of an education system.[9] This possibility is consonant with current views of complexity theory and "chaos" theory.[10]

School District Size: Historically and Today

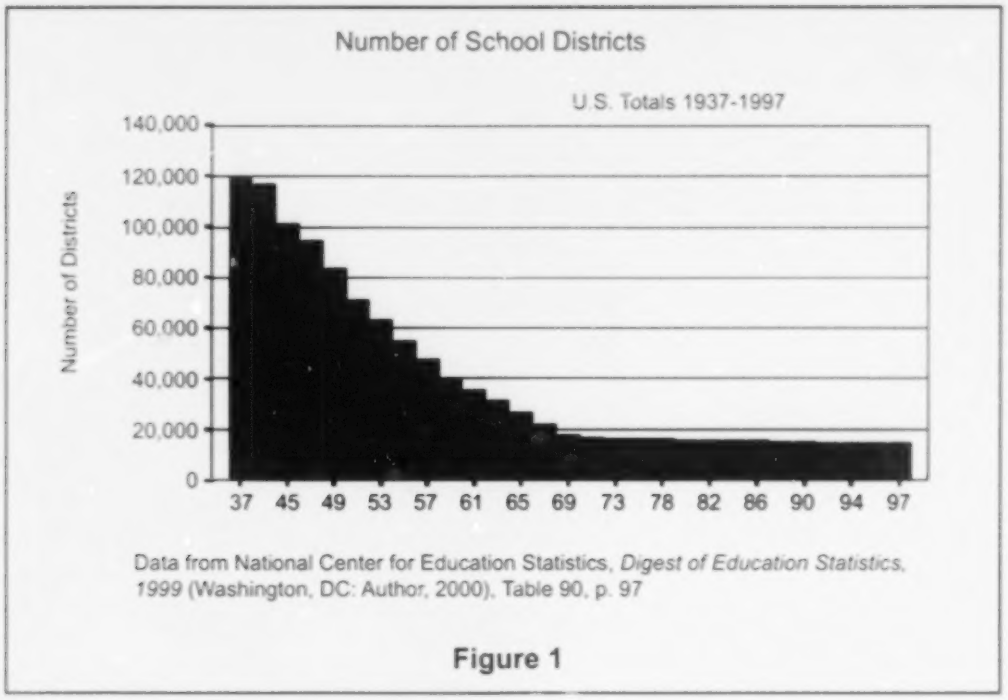
Before we consider issues of district size and school performance, it would be helpful to get a better sense of the distribution of district size in the United States. Surely, some readers might suggest, all rural districts are small by metropolitan standards. This seemingly logical inference does not, however, accord very well with reality. As with many statistical insights, differences within seemingly contrasting groups turn out to be more meaningful than the differences among the groups.

Historical changes. Over the course of the twentieth century, the size of all school districts rose sharply, as the number of districts declined sharply.[11] Originally, during the mid-19th century, districts were established independently and usually operated a single elementary school. This seemingly chaotic system was remarkably successful in enrolling most White children, especially in rural areas.[12] Racism and segregation, however, made schooling inaccessible for many children of color, and, certainly, school terms were short in rural areas and the quality of instruction uncertain and changeable. Nonetheless, this seemingly haphazard and decidedly unbureaucratic system helped make the fledgling United States a hotbed of literacy. Thomas Jefferson's dream of an informed citizenry seemed off to an auspicious, if far from perfect, start.

The twentieth century began with an unknown number of districts but probably in excess of 150,000. In 1937-38, the nation maintained about 119,000 school districts. Twenty years later, in 1957-58, consolidation had effected a 60 percent reduction in the number of districts; approximately 48,000 districts remained in operation.[13] Figure 1 shows the decline in number of districts in increments of about four years between 1937 and 1997.

The correlation between the declining number of districts and declining number of one-teacher schools is nearly perfect (r=.99). The correlation is so strong that given the importance of district consolidation in the writings of early school reformers, most researchers have concluded that district consolidation *caused* the extinction of rural one-teacher schools.[14]

As districts were consolidated and one-teacher schools were closed, the average enrollment in U.S. school districts grew ever larger. In 1937, the average daily attendance (ADA) per district throughout the nation stood at just 187 students. In 1996, the average ADA had increased 1,400 percent to about 2,848 students per district. Variation around this average, of course, is dramatic.



Data from National Center for Education Statistics, *Digest of Education Statistics, 1999* (Washington, DC: Author, 2000), Table 90, p. 97

Figure 1

Rural school districts today. Recent data about rural school districts are much more easily accessed, thanks to the annually updated census of U.S. public schools and public school districts—the *Common Core of Data* (CCD), maintained by the National Center for Education Statistics. This digest reports summary information about rural districts for the 1997-98 school year (but with 1990 census data about household income and education).

What is "rural?" The CCD contains information on two locale classification schemes, each of which is used to identify every school and district in the nation.

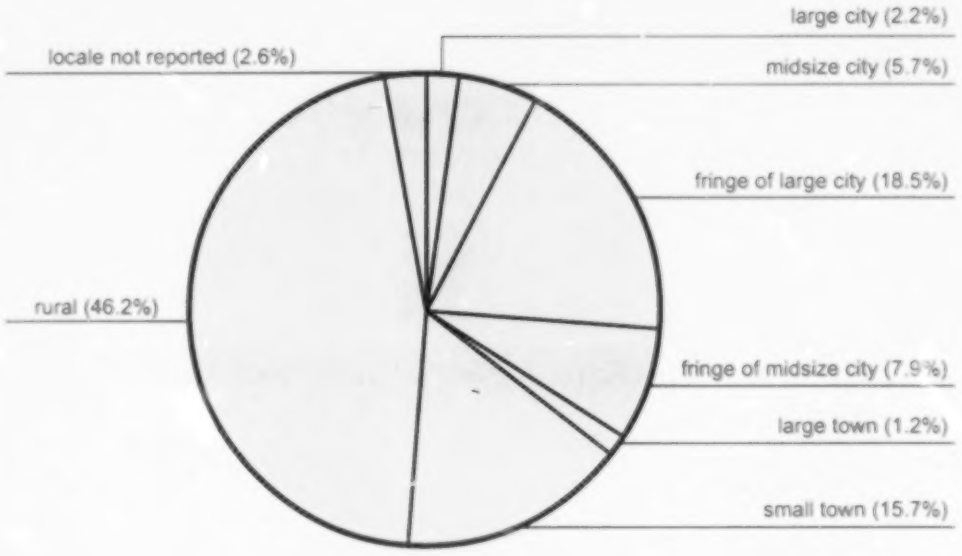
The first locale scheme consists of seven "types of locale codes" devised by Frank Johnson in the late 1980s, ranging from large city to rural.[15] The categories of "rural" and "small town" are often used to describe the "rural" segment of American schooling.[16] Since small towns are the economic centers of rural areas, it is a logical combination and is used in the analyses reported below.

In 1997-98, nearly 64 percent of all school districts were classified as rural or small-town districts.[17] Figure 2 shows the comparative proportion of districts assigned to each location. It clearly demonstrates that, in so far as schooling is a *district* phenomenon, rural and small-town districts are the norm, not the exception.

The second locale classification scheme in the CCD is metropolitan location, divided into three categories: center city of a metropolitan area, metropolitan but not central city, and nonmetropolitan. About 53 percent of all districts are located in *nonmetropolitan* areas.

The two schemes can be profitably combined. Interestingly, in these two schemes, rural and small-town schools are found in both metropolitan *and* nonmetropolitan areas. The overlap is rather substantial. Of the 9,249 identified rural and small- town districts, 1,693 are located in *metropolitan* areas. Indeed, a few of these are specified as being located within the *main cities* of a metropolitan area.[18] To describe the size of "rural" districts, this digest crosses the two locale classification schemes to develop three categories:

1. rural and small-town districts *located in nonmetropolitan areas*



Source: Data from National Center for Education Statistics, *Common Core of Data (CCD): School Years 1993-94 through 1996-97* (CD-ROM; NCES 2000-370), (Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, 2000).

Figure 2

2. rural and small-town districts *located in metropolitan areas*
3. all other districts (i.e., metropolitan districts not located in rural areas or small towns)

Comparing district size among these three groups, Figure 3 shows the average number of students enrolled by location category.[19] Rural and small-town districts, whether metropolitan or nonmetropolitan, on average, enroll about one-fifth the number of students as other districts.

These averages, however, hide a great deal of variation that more accurately describes the U.S. education system. For instance, the "average" size of all U.S. school districts (among the 14,430 districts with nonzero 1997-98 enrollments) is 3,227. The smallest district reported in the 1997 CCD enrolls one student and operates one school; the largest enrolls 1,071,853 students and operates 1,543 schools! Even within the "other schools," the range is large—with the smallest district enrolling seven students (and the megadistrict remaining the largest). What about the size variability among metropolitan and nonmetropolitan rural and small-town districts?

Table 1 reports the averages (that is, means) given in figure 3 but also contains detailed information about the variation in district size by the three-part rural location category. Table 1 tells a lot about the distribution of district size. First, notice that the smallest districts in all locations enroll just a few students. Extremely low district enrollment is *not* just a rural phenomenon.

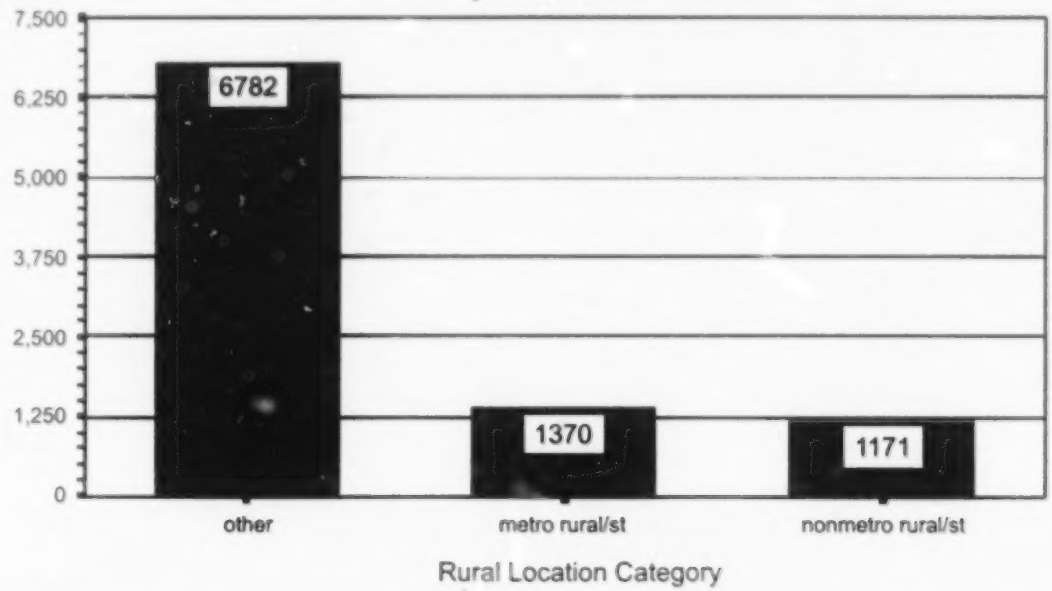
Second, observe that, although the "other" location has the highest maximum, both the rural and small-town categories also have *very large* districts.[20] In fact, the group of *nonmetropolitan* rural and small-town districts has many more very large districts than the metropolitan rural and small-town category. Details will be provided shortly.

Table 1
Variation in District Size by Rural Location Category

Rural Location Category	Mean	Max	Min	Skewness	Number of Districts	SD	% of Districts
Other	6,782.41	1,071,853	7	24.846	5,228	24,769.43	36.2%
Metro rural/small town	1,370.45	19,807	4	4.219	1,682	1,594.03	11.7%
Nonmetro rural/small town	1,170.82	32,444	1	4.467	7,520	1,709.49	52.1%
Total	3,227.17	1,071,853	1	39.563	14,430	15,207.16	100.0%

Third, examine the skewness statistics. "Skewness" measures how lopsided a distribution is and tells if more high or low values are present in a distribution. In table 1, all the values in the skewness column are positive, which indicates many more low than high values in all categories, in other words, many more small districts than large ones. Most important to observe is the very high skewness for "other" districts (that is, skewness=24 as compared to about 4 for the two rural categories). This means the category contains *very many* smaller districts and *very few* quite large ones.[21]

One way to show that small districts actually predominate among city and urban-fringe ("other") districts is to remove the few extremely large districts and look at what remains. If, on this basis, one removes the largest five percent of "other" districts,



Source: Data from National Center for Education Statistics, Common Core of Data (CCD): School Years 1993-94 through 1996-97 (CD-ROM; NCES 2000-370), (Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, 2000).

Figure 3

the remaining maximum size is 22,746—substantially less than the maximum (32,444) for rural and small-town districts. Even among city and urban-fringe districts, few megadistricts exist, and smaller districts predominate.[22]

This discussion of relative district size, however, begs the question of what size might be considered absolutely "large" among rural and small-town districts. This issue will emerge as this digest reviews the literature on district size and student achievement.

Here is one approach to answering the question. Among all such districts (that is, rural and small-town districts located in metro or nonmetro areas), the 95th percentile of size is 4,145 students; 460 rural and small-town districts are larger than this threshold nationwide (379 in nonmetro areas and 81 in metro areas). On the basis of the discussion so far, one might suspect that rural and small-town districts larger than this are not distributed equally across the nation but are probably concentrated in some states.

This suspicion turns out to be correct. In 11 states, *at least 25 percent* of the rural and small-town districts enroll 4,145 students or more (Alabama, Florida, Georgia, Louisiana, Maryland, North Carolina, Nevada, South Carolina, Utah, Virginia, and West Virginia). By contrast, in seven states, *less than one percent* of rural and small-town districts enroll this many or more students (Iowa, Illinois, Maine, Montana, North Dakota, New Hampshire, New Jersey, and Oklahoma). North Dakota and New Hampshire maintain no rural or small-town districts this large, and neither does New Jersey (which has 58 metropolitan rural and small-town districts). Finally, in 25 states, fewer than five percent of rural and small-town districts have enrollments at or above the 4,145-student threshold.[23]

On the basis of such data, a threshold of about 4,000 students seems one reasonable place to locate a distinction between absolutely "larger" rural and small-town districts and absolutely "smaller" rural and small-town districts. Many rural districts in the United States, of course, are much smaller than this threshold. In fact, a recent book examining good small rural high schools suggests 1,500 as the upper limit of *district size* for locales serving *impoverished communities*, rural or urban.[24] The logic behind this suggestion comes from recent studies of district size, to be considered next.

Relationships between School District Size and Student Achievement

In 1973, British industrialist E. F. Schumacher published a phenomenal volume that marked a sea change in thinking about organizational scale: *Small is Beautiful*.[25] At that time, bigness was widely regarded as indispensable for a truly efficient operation. Schumacher's work was an early sign that times were changing.

The 1970s were also a decade of rural renaissance, and rural, then as now, was seen as featuring a congenial scale of life and purpose.[26] For the first time since the Depression, the proportion of total U.S. population living in rural areas also rose. In many ways, this "renaissance" continues.[27]

By the late 1980s, the sea change had begun to flood into the thinking of leading education researchers[28] and influence innovative practitioners.[29] By the late 1990s, education leaders had begun to echo the call for smaller schools.[30] But the calls have not yet extended to district size.

The Research Base

Evidence that district size has an effect on student achievement is mounting, nonetheless. Examining the direct influence of district size on achievement, results suggest a negligible influence.[31] In education and sociology, however, important influences are often indirect.[32] The recent literature relating district size to school performance rests almost entirely on an indirect relationship in which socioeconomic status (or poverty) and size work *jointly* to influence school

performance.[33] In other words, the interaction of poverty and district size exerts an important influence on school performance.

C. Bidwell and J. Kasarda were among the first to raise this possibility.[34] They hypothesized that the effects of socioeconomic status (SES) might be mediated by size (or vice versa), as a structural condition of a district. Their 1975 study of Colorado districts, however, failed to confirm a net influence of district size on district-level (*not* school-level) academic performance, perhaps because they excluded from their analysis 72 of Colorado's 176 districts.

N. Friedkin and J. Necochea formalized and tested the theory with greater specificity than their predecessors.[35] They suggested that community SES is the "environmental condition" that indirectly regulates the influence of size on achievement through "constraints" and "facilitators" of "goal attainment." Using data on all California schools and districts, they found that smaller size tended to benefit students in impoverished communities, but larger size tended to benefit students in affluent communities. In addition, they pioneered a calculus application to interpret regression results as effect sizes across varying SES levels.[36]

Craig Howley—interested in the extent to which such results might pertain in a rural state with a very different economy, history, and political legacy—replicated the Friedkin and Necochea study in West Virginia, with much the same results.[37] The West Virginia study also assessed the influence that SES had on school and district performance in larger schools and districts compared to smaller districts and schools. The link between SES and achievement was *much weaker* in both smaller schools and smaller districts. This means that smaller units seemingly work to reduce the link between poverty and achievement. (It is important to realize that smaller and larger schools exhibit the full range of SES; that is, smaller schools serve affluent as well as impoverished communities.)

Robert Bickel joined Howley in examining the issue in four additional states chosen purposively to reflect national variability: Georgia, Montana, Ohio, and Texas. He found strong evidence of an interactive effect of district size in Ohio. Texas, however, exhibited strong evidence of a direct, not interactive, effect of size. He discovered weak evidence in Montana (a state that maintains very small districts, as indicated previously) but no district-level effect at all in Georgia.[38]

Intrigued by the Georgia case, Bickel and Howley used the same Georgia data set to conduct a multilevel analysis of the joint interactive effects (on school performance) of school size within district size. Results showed cross-level size effects not evident in single-level analyses.[39]

Though complex, the overall patterns are easily summarized. The influential cross-level interactions are as follows; each was shown to exert a negative influence on school performance: *district* size interacting with *school* size ($p<.01$), *district-level* socioeconomic status interacting with *school* size ($p<.001$), and *district* size interacting with *school-level* socioeconomic status ($p<.001$).[40]

As indicated, results exhibited very high statistical significance. The practical significance of this series of studies is also high. In this entire series of investigations (in these five quite different state contexts) into the influence of district size on school performance, two principles are clear:

- First, in impoverished communities, small schools in small districts boost school performance. In general, more impoverished locales should have smaller districts and schools.

- Second, in *every single comparison made* in each of the five studies,[41] smaller districts and smaller schools demonstrated greater achievement equity. The uniformity of these results is striking.[42]

The second of the preceding points raises the interesting prospect that excellence is realized through equity. These two qualities—so often portrayed in education literature as competing values—may actually be linked in a way that translates into substantial improvement in school performance for impoverished communities.[43]

Implications

Implications can be drawn for practice, research, and policy analysis.

Implications for practice. In the most conservative interpretation, the research on district size reported here accords with R. Kennedy's advice for Arkansas[44] and J. Adams' advice for Kentucky.[45] Claims that district consolidation will improve school performance are not supported.

But the research described above also suggests that school boards, superintendents, and communities should consider the deconsolidation of larger districts that serve impoverished communities. Smaller district size does not guarantee improved test scores, but ample evidence suggests it will increase the odds for improvement in school performance. In the case of rural districts, 4,000 or 5,000 students is a reasonable threshold (that is, at or above approximately the 95th percentile for all rural and small-town districts). Needless to say, such a rubric would have drastic implications for some states but hardly any applicability in others.

Implications for research. The single-level studies confirm time and again the existence of substantial school-level interaction effects of size and SES on school performance.[46] More remarkable still are the strikingly consistent school-level and district-level equity effects of small size on school *and* district performance: relationships between SES and performance are reduced—often dramatically—in smaller schools and districts. Do the striking equity findings for school performance apply when students are the unit of analysis? Research has not determined yet.

Obviously, additional state-based multilevel studies are warranted. Do the sorts of relationships observed in Georgia prevail in other states? To what extent? At what grade levels are the effects strongest? Do the cross-level equity effects, so consistent in single-level analyses, prevail in other states?

Policy analysis. Evaluations of structural alternatives to "Fordist" conceptions of educational scale are sorely needed, and a focus on district size would seem a logical starting point from an organizational perspective.[47] Evaluations also need to consider revision of the interrelated policies that inscribe Fordist perspectives at all levels of the educational enterprise—and the domains include standards for facilities, rural school busing, curriculum, staffing, and community engagement.

Conclusion

The task of making so many schools and districts much smaller may well seem daunting; however, it should appear more feasible if understood as a project to be accomplished in the course of 30 or 40 years. After all, the current situation did not appear overnight either. It, too, was a daunting task, undertaken with reasons that seemed good at the time. Times have changed. Perhaps research has provided more information about what decent schooling requires.

Herbert Walberg's and James Guthrie's early interest in the issue of scale seems to have been well founded.[48] Further studies are clearly needed, but it is time for superintendents and policymakers to begin considering the issue of scale: the complex relationship of class, school, and district size in creating an environment in which excellence and equity function together to reinforce one another for the benefit of impoverished communities. If the nation eventually commits to the creation of smaller schools and districts, of course, it will need to cultivate substantially more school leaders (principals, superintendents, lead teachers, and teacher-leaders). This leadership could well be imagined as constituting values and perspectives quite different from those used to run the "factory-model" of schooling. Indeed, efforts to cultivate such leadership on new bases, even for rural areas, are well under way.[49]

Notes

1. See, for example, J. Adams, *School District Size and State Educational Costs in Kentucky*, revised, unpublished paper, Frankfort, KY, 1994, ERIC Document Reproduction Service No. ED 371 921; and A. Ramirez, "Size, Cost, and Quality of Schools and School Districts: A Question of Context," chapter 4 in *Source Book on School and Di: rict Size, Cost, and Quality* (Chicago and Minneapolis: Hubert H. Humphrey Institute of Public Affairs and North Central Regional Educational Laboratory, 1992), ERIC Document Reproduction Service No. ED 361 158.

2. See R. Bickel and C. Howley, "The Influence of Scale on Student Performance: A Multi-Level Extension of the Matthew Principle," *Education Policy Analysis Archives* [On-line serial] 8:22 http://olam.ed.asu.edu/epaa/v8n22/ (2000).

3. See, for example, C. Achilles, "Small Classes, Big Possibilities," *School Administrator* 54(9): 6-9, 12-13, 15 (1997); T. Ellis, *Class Size* (Eugene, OR: ERIC Clearinghouse on Educational Management, 1984), ERIC Document Reproduction Service No. ED 259 454; J. Finn, *Class Size and Students at Risk: What Is Known? What Is Next?* (Washington, DC: National Institute on the Education of At-Risk Students, 1998), ERIC Document Reproduction Service No. ED 418 208; and G. Glass and M. Smith, "Meta-Analysis of Research on Class Size and Achievement," *Educational Evaluation and Policy Analysis* 1(1): 2-16 (1979).

4. See Achilles, "Small Classes, Big Possibilities."

5. Namely, the National Association of Secondary School Principals and the Carnegie Foundation, *Breaking Ranks: Changing an American Institution* (Reston, VA: Author, 1996); M. Fulton, *The ABCs of Investing in Student Performance* (Denver: Education Commission of the States, 1996), and U.S. Secretary of Education R. Riley, "Schools as Centers of Community" (speech delivered at the annual meeting of the American Institute of Architects, Washington, DC, 1999). The range of good effects anticipated from efforts to reduce the size of schools is wide indeed (K. Cotton, *Affective and Social Benefits of Small-Scale Schooling*, ERIC Digest EDO-RC-96-5 [Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools, 1996], ERIC Document Reproduction Service No. ED 401 088; and D. Meier, "The Power of Their Ideas: Lessons for America from a Small School in Harlem" [Boston: Beacon, 1995]). Though some claims are probably exaggerated, a clear preponderance of evidence suggests that, on average, smaller school size has solid academic benefits for impoverished stude· :s (Fulton, *The ABCs of Investing* and C. Howley and R. Bickel, *The Matthew Project: National Report* [Randolph, VT: Rural School and Community Trust Policy Program, 1999]). This is significant news because poverty is the risk factor that threatens student achievement most.

6. See J. Alspaugh, "A Comparison of Four Enrollment Groups of K-8 and K-12 Missouri Rural School Districts" (paper presented at the annual meeting of the National Rural Education Association, Salt Lake City, October 1995), ERIC Document Reproduction Service No. ED 389 501; C. Howley, "Compounding Disadvantage: The Effects of School and District Size on Student Achievement in West Virginia," *Journal of Research in Rural Education* 12(1): 25-32 (1996); Howley and Bickel, *Matthew Project*; and H. Walberg and W. Fowler, "Expenditure and Size Efficiencies of Public School Districts," *Educational Researcher* 16(7): 5-13 (1987).

7. Concern for operations in school district research has sometimes led to the conclusion that the largest districts in the nation are "ungovernable" because their mammoth size sponsors tremendous power for a few and powerlessness for most (see R. Brown, *Schools of Thought: How the Politics of Literacy Shape Thinking in the Classroom*, [San Francisco: Jossey-Bass, 1991]), with impoverished children and communities the predictable losers.

8. These "core issues" are, more abstractly, those of excellence, equity, and adequacy.

9. See, for example, Bickel and Howley, "Influence of Scale"; and J. Guthrie, "Organizational Scale and School Success," *Educational Evaluation and Policy Analysis* 1(1): 17-27 (1979).

10. The full continuum of scale extends from a coarser scale at one end (state and national systems) to a finer scale at the other end (to individual students in a class or reading group, for instance). It may seem strange to regard students in this way as part of the scaling of a system. Consider, however, that students who are more "attentive" may well bring a more finely grained perspective to the task of learning. If particular students engage learning tasks better in smaller schools and classes, perhaps they will do so, in part, through such improved "attentiveness." By contrast, the alienation said to characterize large schools within large districts would hypothetically subvert such attentiveness, in part, via the operation of "scaling." This example helps suggest the way structures at higher levels of educational scale might be echoed at lower levels (e.g., state to district to school to classroom to student). See R. Thiétart and B. Forgues, "Chaos Theory Organization," *Organization Science* 6(1): 19-31 (1995); and J. Gleick, *Making A New Science* (New York: Penguin, 1987), among many others, for discussions of complexity and chaos theory as related to scaling.

11. The usual measure of district size, and the one used here, is total student enrollment. The geographic size of school districts is a separate issue, hypothetically related to school transportation. Statistics reported here were, in most cases, computed by the author from NCES data. Historical data analyzed by the author come from the National Center for Education Statistics (NCES), *Digest of Education Statistics, 1999* (Washington, DC: Author, 2000) and current data from NCES, *Common Core of Data (CCD): School Years 1993-94 through 1996-97* (CD-ROM; NCES 2000-370) (Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, 2000).

12. See L. Cremin, *American Education: The National Experience* (New York: Harper and Row, 1980).

13. 1937-38 is the first year for which NCES reports the number of U.S. districts. Today, just under 15,000 regular public school districts remain.

14. See, for instance, E. Cubberley, *Rural Life and Education. A Study of the Rural-School Problem as a Phase of the Rural-Life Problem* (New York: Houghton-Mifflin, 1915), ERIC Document Reproduction Service No. ED 392 559; and A. DeYoung, *The Life and Death of a Rural American High School: Farewell, Little Kanawha*, (New York: Garland, 1995). In 1957-58, 25,000 one-teacher schools still operated in the United States, down from 149,000 in 1929-30 and 121,000 in 1937-38. By 1980, only 1,000 one-teacher schools remained; in 1997-98, the United States maintained just 476 such schools (see NCES, *Digest of Education Statistics, 1999*, Table 90).

15. See, for example, F. Johnson, "Assigning Type of Locale Codes to the 1987-88 CCD Public School Universe" (paper presented at the annual meeting of the American Educational Research Association, San Francisco, March 1989), ERIC Document Reproduction Service No. ED 312 113. Each school and district is assigned to one locale, based on zip-code analysis. District location in this scheme is *not* based on the zip code of the central office, however, but on the preponderance of school-level locales within the district, in accord with a rubric devised by NCES. The seven types of locale are large city, midsize city, urban fringe of large city, urban fringe of midsize city, large town, small town, and rural. In recent analyses, NCES has reported statistics in a three-part aggregation of locales: cities, urban fringes, and rural areas and small towns (see, for example, NCES, 2000). "Small towns" have populations less than 25,000, and "rural" means places with populations less than 2,500 or in the open country.

16. See C. Howley and J. Stern, "A New Age for Research in Rural Education?" *Rural Education Newsletter for a Special Interest Group of the American Educational Research Association* (special supplement 2) (spring 1996), ERIC Document Reproduction Service No. ED 370 734.

17. About 36 percent of *schools* were located in rural areas or small towns, and about 24 percent of *students* attended schools located in rural areas or small towns.

18. There were seven such districts, including two classified as rural; these cases may represent a degree of error, but, in some states, "villages" and "towns" do exist as separate entities within "cities." Urban sprawl continues to consume rural places, but this continuing appropriation of rural areas by urban areas, in fact, means that rural areas exist for a time within urban areas (that is, until such time as they are finally transformed out of existence).

19. The 1997 CCD contains several hundred records for districts with "0" as the reported enrollment or "0" for the number of schools operated. These records have been suppressed for this analysis, since this digest is interested in districts that actually enroll students and that maintain at least one school. (Cases with zero values for these variables include districts that pay tuition to other districts for schooling their children.)

20. New York City, with its more than *one million* students, has a single city board of education but also maintains dozens of "district" boards not officially classified as LEAs. The city board remains New York's LEA.

21. In fact, the median size (2,698 students) of "other" districts is considerably smaller than the mean of 6,782 given in Table 1. The median size is the enrollment figure that divides the "other" districts into a smaller and larger half.

22. In fact, by eliminating just the "other" 26 districts with enrollments of 100,000 or greater (districts at about the 99th percentile of size nationally), the remaining distribution has a mean of about 5,300, a median of about 2,500, and a standard deviation of about 9,200. The 95th percentile of size without the 26 megadistricts is about 20,000 students, the maximum is about 96,000, and the skewness is reduced to 4.4 (comparable to the skewness in the two rural categories).

23. The distribution also varies by metro or nonmetro location within each state, but within many states, a larger *proportion* of metro rural and small-town districts than nonmetro districts exceeds the threshold.

24. See C. Howley and H. Harmon, eds, *Small High Schools That Flourish: Rural Context, Case Studies, and Resources* (Charleston, WV: AEL, Inc., 2000).

25. See E. F. Schumacher, *Small is Beautiful: Economics as if People Mattered* (New York: Harper and Row, 1973).

26. See, for example, S. Nearing and H. Nearing, *Living in the Good Life* (New York: Schocken Books, 1970).

27. See E. Beeson and M. Strange, *Why Rural Matters: The Need for Every State to Take Action on Rural Education* (Randolph, VT: Rural School and Community Trust Policy Program, 2000), available on-line: http://www.ruralchallengepolicy.org/streport.html/.

28. See, for example, J. Goodlad, *A Place Called School: Prospects for the Future* (New York: McGraw-Hill, 1984); T. Husén, "The School in the Achievement-Oriented Society: Crisis and Reform," *Phi Delta Kappan* 66(6): 398-402 (1985); and E. Haller and D. Monk, "New Reforms, Old Reforms, and the Consolidation of Small Rural Schools, *Educational Administration Quarterly* 24(4): 470-83 (1988).

29. See, for example, Meier, *Power of Their Ideas*.

30. See Fulton, *ABCs of Investing*; and Public School Forum, *The Things That Matter: Guiding Principles for Strengthening the System of Funding North Carolina's Public Schools* (Report of Study Group Eight) (Raleigh, NC: Author, 1999).

31. See R. Kennedy, "Educational Indicators and Eighth Grade MPT Passing Rates" (paper presented at the annual meeting of the Arkansas Association for Supervision and Curriculum Development, Hot Springs, AR, June 1990), ERIC Document Reproduction Service No. ED 322 188; and Ramirez, "Size, Cost, and Quality."

32. J. Stevens, *Applied Multivariate Statistics for the Social Sciences*, 3d ed. (Mahwah, NJ: Lawrence Erlbaum, 1996).

33. Herbert Walberg and colleagues, however, have developed conclusions about the influence of district size on performance that are partially compatible with those from the research summarized here; in particular, see Walberg and Fowler, "Expenditure and Size Efficiencies"; and H. Walberg and H. Walberg, "Losing Local Control," *Educational Researcher* 23(5): 19-26 (1994).

34. See C. Bidwell and J. Kasarda, "School District Organization and Student Achievement," *American Sociological Review* 40(1): 55-70 (1975).

35. See N. Friedkin and J. Necochea, "School System Size and Performance: A Contingency Perspective," *Educational Evaluation and Policy Analysis* 10(3): 237-49 (1988).

36. This application shows the degree to which the influence of size varies as SEAs change. The application is useful because most research looks for influences that are constant, regardless of setting; most researchers are not used to influences that vary among settings. The point here, however, is that this variation is *regular* and *predictable*.

37. See Howley, "Compounding Disadvantage."

38. See Howley and Bickel, *Matthew Project*.

39. See Bickel and Howley, "Influence of Scale."

40. Results were stronger at the 8th grade than at the 11th grade level, doubtless because many impoverished students leave school before the 11th grade. Their absence in larger schools and districts would be predicted to attenuate otherwise observable effects.

41. See Bickel and Howley, "Influence of Scale," and Howley, "Compounding Disadvantage," for a complete description of methods used to assess achievement equity. In brief, these studies compared the strength of the relationship between school- or district-level achievement and SES among separate groups of districts or schools (e.g., in the multilevel study, large schools in large districts, small schools in large districts, large schools in small districts, and small schools in small districts).

42. Usually, the amount of variance in school performance attributable to poverty (or socioeconomic status) was reduced by half. In some analyses (particularly in Montana, where small schools and districts prevail), it was nearly eliminated.

43. See, for example, F. Wirt and M. Kirst, *Schools in Conflict: The Politics of Education*, 2d ed. (Berkeley, CA: McCutchan, 1989).

44. See Kennedy, "Educational Indicators."

45. See Adams, *School District Size*.

46. See, for example, Friedkin and Necochea, "School System Size and Performance"; and Howley and Bickel, *Matthew Project*.

47. "Fordist" was coined after the large-scale, mass-production methods first deployed by Henry Ford in the manufacture of the Model T automobile. The "factory model" of schooling is a Fordist conception (see D. Harvey, *The Condition of Postmodernity* [Cambridge, MA: Basil Blackwell, 1989]).

48. J. Guthrie, "Organizational Scale and School Success," *Educational Evaluation and Policy Analysis* 1(1): 17-27 (1979); and Walberg and Fowler, "Expenditure and Size Efficiencies."

49. See for example, B. Keller, "Building on Experience," *Education Week*, May 3, 2000, 36-40.

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